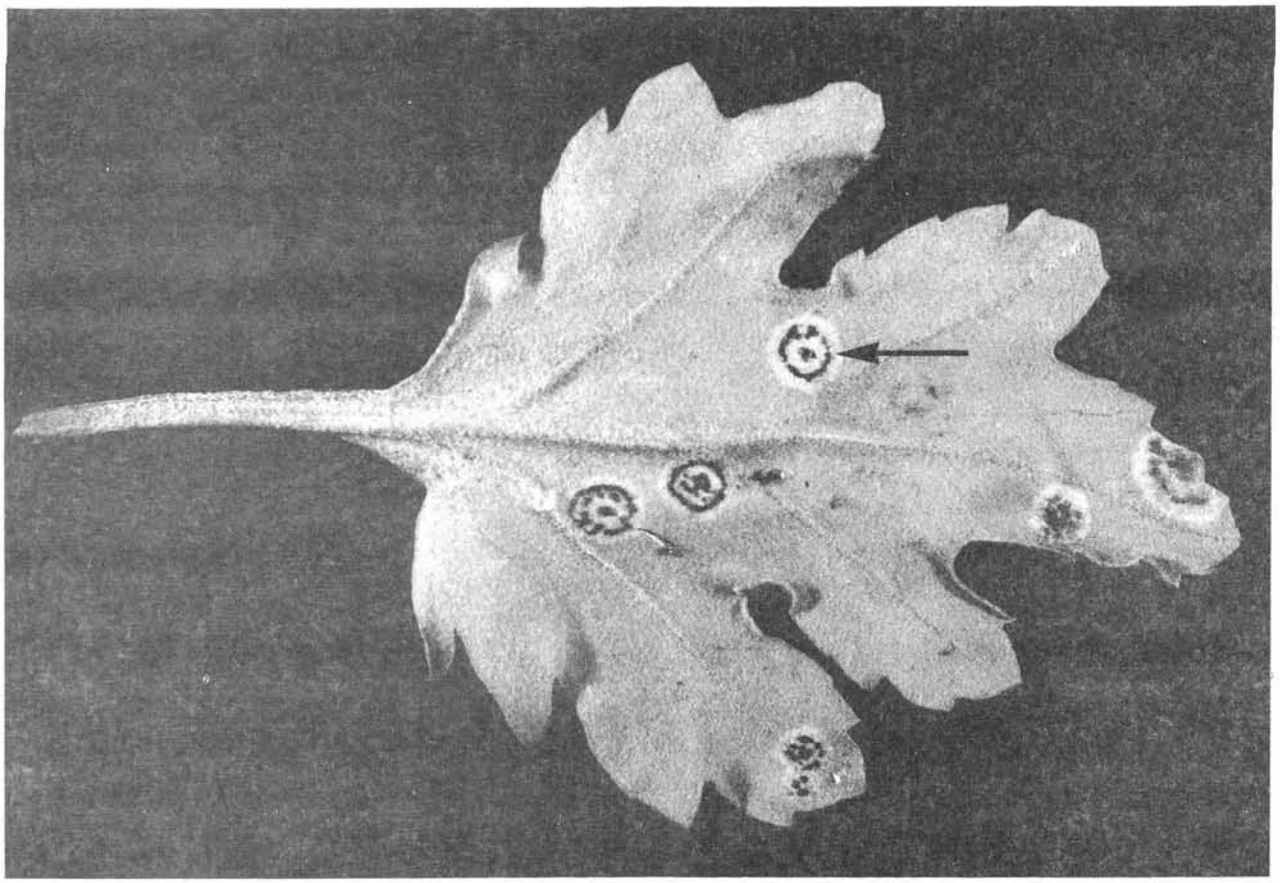
CALIFORNIA PLANT PEST and DISEASE REPORT

Volume 2 Number 2
March 1983

California Department of Food and Agriculture 1220 N Street Sacramento California 95814



Rust pustules (arrow) form the characteristic target-shaped signs of the fungus *Puccinia chrysanthemi* on the underside of a chrysanthemum leaf. (Photo by Dave Higuera)

CHRYSANTHEMUM RUST

T.E. Tidwell and K.L. Kosta

A disease of Chrysanthemum which results in disfiguring of the foliage is the "common rust" caused by the fungus *Puccinia chrysanthemi*. The disease occurs wherever chrysanthemums are grown.

Symptoms begin as chlorotic flecks on upper and lower leaf surfaces, followed by the formation of dark, powdery pustules (uredia), predominantly on the undersides of the leaves and on the stems. These pustules eventually become surrounded by "rings" of secondary pustules (arrow, cover photograph).

Spread of the disease is principally by vegetative propagation of infected stock and by the airborne urediospores. Optimum conditions for successful infection include temperatures ranging from 16-21 C (60-70°F) for spore germination and 16-27 C (60-81°F) for infection. These temperatures, coupled with free moisture from condensation, mists, or splashing water (e.g. sprinkler irrigation), provide ideal conditions for infection, and for spread of the pathogen. The fungus overwinters as mycelium in the infected leaves. In addition, spores can remain viable on senescent leaves for several days, even at sub-zero temperatures.

The pathogen does not do well at high temperatures. In fact, infections up to 12 days old can be eradicated by exposure of the infected plants to temperatures of 31 C (87°F) for 24 hr, or of 38 C (101°F) for 8 hr. Since the pathogen does not infect or spread under dry conditions, adequate spacing of the plants to promote good air circulation, maintaining humidity on the low side, and avoiding the wetting of foliage will all help to control the disease. Of course, only stock which is known to be free of rust should be used for propagation. Protective fungicide sprays have also been suggested for control of chrysanthemum rust, although special attention should be paid to whether contact fungicides or systemic fungicides are used. The grower should remember that new growth appearing after application of a contact fungicide will be unprotected and will require subsequent applications.

References

Horst, R.K. and Nelson, P.E. 1975. Diseases of Chrysanthemum. N.Y. State College of Agriculture and Life Sciences, Ithaca, N.Y. 36 pp.

McCain, A.H. 1977. Chrysanthemum Disease Control Guide. University of California Cooperative Extension Leaflet 2861, Berkeley, CA. 3 pp.

T.E. Tidwell is a Plant Pathologist and K.L. Kosta is an Agricultural Inspector, with the CDFA Analysis and Identification Unit, Sacramento.

Calif. Pl. Pest Dis. Rep. Vol. 2, No. 1: 1-41 was issued on 21 January, 1983.

Calif. Pl. Pest Dis. Rep. Vol. 2, No. 2: 42-69 was issued on 24 March, 1983.

WHITEFLY TRANSMITTED VIRUSES

Dennis E. Mayhew

Discovery of new or undescribed plant virus diseases has occurred frequently in recent years, particularly in southern California. The most economically significant of these are the whitefly-transmitted viruses which have appeared primarily in Imperial County.

Much of the work of detecting and identifying these diseases and determining their properties, vector relationships and host ranges has been performed by Dr. James Duffus, Plant Virologist, USDA Agricultural Research Station, Salinas, and by Dr. Robert Flock, Entomologist, Imperial County Department of Agriculture.

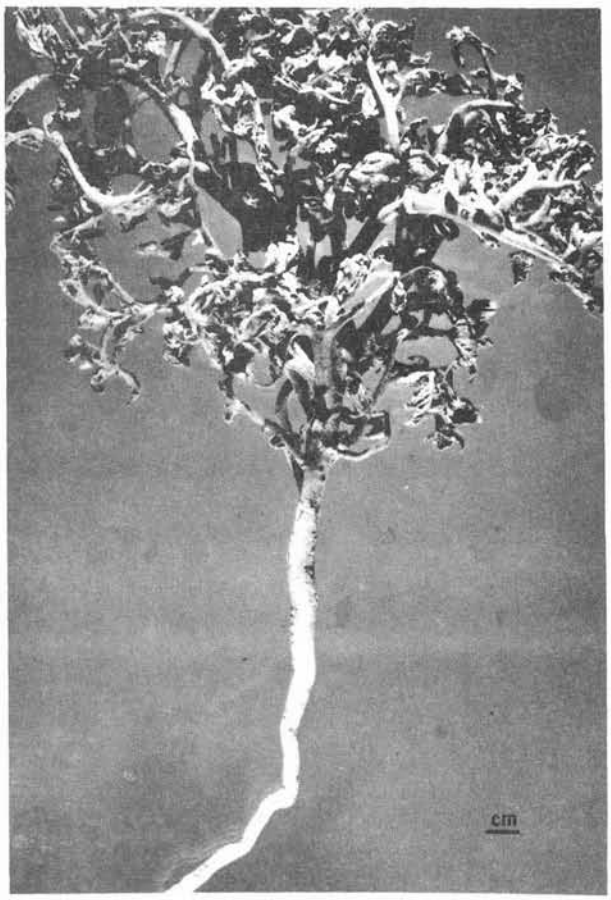


Fig. 1. Mature tomato plant infested with tomato necrotic dwarf virus. Note size of plant as measured by scale at right.

According to Duffus, there appear to be at least five distinct whitefly-transmitted virus entities in the southern irrigated desert areas, affecting a variety of crops. They include:

Cotton leaf crumple
Squash leaf curl (two different isolates)
Lettuce infectious yellows
Tomato necrotic dwarf

The latest virus added to the list, recently named tomato necrotic dwarf by Duffus, causes severe stunting and distortion of tomato plants (Fig. 1) and causes them to produce no fruit. The most efficient vector of this and the other identified viruses is the sweet potato whitefly *Bemisia tabaci*. The range of this insect in California is limited to the southeastern desert areas of Riverside and Imperial Counties.

Dennis E. Mayhew is a Plant Pathologist with the Analysis and Identification Unit of CDFA in Sacramento.

* * * * * *

READERS PLEASE NOTE

For reasons of economy, it is necessary that we periodically update our mailing list for this publication. If you wish to continue to receive the CALIFORNIA PLANT PEST AND DISEASE REPORT, please return the coupon which appears on the back page of this issue.

Computer assisted semi-automatic identification of *Helicotylenchus* species -The program Nemaid-

R. Fortuner

Identification of nematodes to the species level is generally accomplished by specialists working in a well-defined area. Knowing the goegraphical origin and the host of the sample of a nematode population, the identifier will often recognize the species to which a nematode belongs just by looking at it. He will use a dichotomous key as a check to confirm his identification.

Plant nematology is a growing science. More and more people need to identify more and more species of nematodes. The specialists are too few to handle the increasing number of identifications that have to be made. When non-specialists try to use dichotomous keys to identify nematodes, they often find that the sample they are studying falls between several described species. The dichotomous key suffers from several basic flaws which render it unworkable at least with large genera such as *Helicotylenchus*, where the intra-specific variability is high.

The limitations of dichotomous keys will be explained below, and an alternate method using a computer will be proposed.

1. The failure of the dichotomous key.
The problem raised by dichotomous keys are different according to the kind of criteria they use: measurements, two-state characters or multi-state characters.

1.1 Measurements
Measurements of nematodes vary. Some of this variability is due to the normal genetic variability of living beings, but for the most part it is due to external factors such as food supply, temperature, soil type, etc.

Some authors have concluded from this high intra-specific variability that measurements cannot be used to differentiate species. However, if the values of a measurement for two nematode populations are farther apart that can be accounted for by the intra-specific variability, this measurement should be accepted as a differentiating criterion.

In a dichotomous key, the taxonomic significance of the difference between two measurements is not considered. Rather, a threshold value is proposed which is supposed to divide the species of the genus into two groups: those above and those below this threshold.

In some genera it is easy to propose such a threshold because there is a gap in the specific values for the measurement. In *Ditylenchus*, about half the species have stylets 7-8 µm long, and the rest of the species have stylets 10-12 µm long.

In other genera, such as *Helicotylenchus*, no gap exists that would permit a clear division of the genus. For stylet length, and for all the other measurements, a dichotomous statement such as stylet longer vs. shorter than X µm cannot be made.

****

R. Fortuner is a Nematologist with the CDFA Analysis and Identification Unit, Sacramento.

1.2 Morphological characters.

1.2.1 Two-state characters
Some morphological characters exist under only two states in *Helicotylenchus*. For example males, or canals (fasciculi) are either present or absent in a particular species. There is no intra-specific variability and these characters can be used in a dichotomous key. However there are few such characters, and they can be used to differentiate only a few species. For example, canals are known only in seven species out of more than 150 described species in *Helicotylenchus*.

1.2.2 Multi-state characters
Most morphological characters present some variability and have to be described under three or more states. For example, in different species of *Helicotylenchus*, the habitus can be:

-always spiral
-always C-shaped
-spiral in some specimens, and C-shaped in others.

Other characters show an even greater variability. The tail for example can be described under five basic shapes in *Helicotylenchus*, and most species group individuals with tails falling in two or even three of these categories.

A dichotomous key cannot propose a single statement to differentiate more than two different shapes. It cannot take into acount the variability of a character when different individuals of the species present different states of the character. Because of these basic flaws, no good dichotomous key can be proposed for *Helicotylenchus*.

2. Computer-aided identification

2.1 General coefficient of similarity.
It is possible to compare two nematode populations without using a dichotomous key by considering the values in each population of each successive taxonomic character. The similarity of the successive couplet of characters can be estimated on a scale zero to one, by counting a score of one for perfectly matched characters and a score of zero for a complete mismatch. The average value of the scores of the successive characters gives a measure of the overall similarity between the two populations. If an unknown population is compared successively to all the known species in a genus, a list of similarity coefficients can be obtained. The correct identification is probably among the species with the highest score (closest to one). This method has originally been described by Gower (1971). It is impossible to calculate manually the successive coefficients of similarity. A computer program for the calculation of these coefficients has been written, according to the assumptions below.

2.2 Score S of the comparison between two measurements
The value C_x* of a measurement C in a sample from an unidentified population X is compared to the value C_s of the same measurement as it is known in a species s. The intraspecific variability V_c which has been estimated for the character c in the genus *Helicotylenchus* is taken into account. The difference between the values C_x and C_s is also compared to

the difference which exist in *Helicotylenchus* between the species with the highest value for C (Cmax), and the species with the smallest value (Cmin) for the same character. The ratio is adjusted so it will be equal to one for species with similar values of C ($C_X \simeq C_S$):

$$S = 1 - \frac{/C_X - C_S/ - V_c}{C_{max} - C_{min} - V_c}$$

with $/C_X - C_S/ - V_c \geqslant 0$

*:Only the mean values of the measurements are included in the program Nemaid. The range of measurements in the sample, meaningless and misleading, is never considered.

2.3 Score S of the comparison between two morphological characters.

2.3.1 Two-state characters with no intra-specific variability. These characters are completely described by a one-digit code: 0 for absence, 1 for presence.

The presence of the character in both samples, (1-1) or its absence in both samples, (0-0) is counted as a match: S=1.

If the character is present in one sample and absent in the other, (1-0) a mismatch is counted: S=0.

2.3.2 Two-state characters variable intra-specifically.
A two-digit code is necessary to describe these characters. For example the character habitus appears in two states: spiral (0:absent/1:present) and c-shaped (0:absent/1:present). A species can be coded 10 (always spiral), 01 (always c-shaped);or 11 (some individuals spiral, others c-shaped).

As above, matches, either positive (1-1) or negative (0-0) are counted S=1; mismatches (1-0) are counted S=0.

Because of the two-digit code, S varies from 0 to 2. In order to fit the definition of S given above (S from 0 to 1) we must divide the score S by 2: finally S will be equal to 0, 0.5, or 1.

2.3.3 Multi-state characters.
Multi-state characters require codes with as many digits as they have states. Tail shape for example will be coded with five digits: 10000, 01110, etc. As above, the score for the five successive digits must be divided by the number of digits. However here we cannot accept the negative matches (0-0). If we did, two species with perfectly dissimilar tail shapes, for example 10000 (=only shape 1 observed) and 00001 (only shape 5 observed), would have 3 negative matches and receive a final score S=3/5, which does not reflect their dissimilarity. For the multi-state characters, the negative mismatches are neutralized; in the above example, there are two mismatches and 3 neutralized negative matches; the final score S is 0/2=0.

2.4 Computation of the general coefficient of similarity S_g.

For each character, S is calculated , then multiplied by W=1 if both values are known for the measurement. If one value or both are missing, S cannot be measured. W is then taken equal to zero, which neutralizes the character for the final computation of S_g.

When all the scores S have been calculated for the known characters, the scores are added and divided by the number (W) of known characters. This gives the general coefficient of similarity between the two populations being compared.

3. Identification

3.1 List of the highest coefficients
The program makes the above calculations between an unidentified population and all the known species whose characteristics are included in a reference data file. All the coefficients are arranged by decreasing values and the highest coefficients (with values between 1 and 0.7) are printed.

3.2 Final decision.
The program presents the user with a list of likely names. The species with the highest score is the most likely candidate, but this is not absolute. It is conceivable that a species with a single mismatch cannot be accepted for identification if this mismatch occurs on a taxonomically significant character. On the other hand, an identification may be accepted in spite of several mismatches on secondary characters.

The final decision on identification should be made by comparing the unidentified population to the species proposed by the program. The program offers the possibility to call any such species. The values of the characters describing the sample and the species called are presented side by side with the score (S=0,1) obtained by each couplet of values during the computation of S_g. It is highly recommended to confirm the identification by a study of the descriptions and figures from the original author of the species.

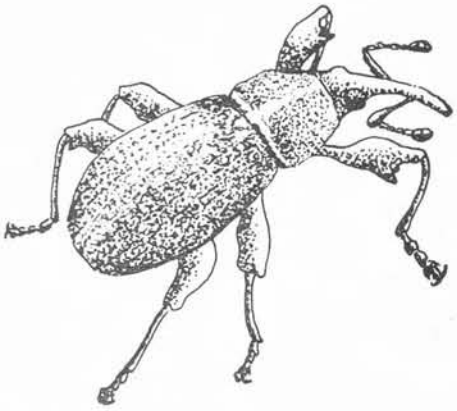
Discussion

The program presented above is reliable with two limitations. Some species included in the reference list were described from very small samples; often the describers omitted calculating the mean values of the measurements. This is quite unsatisfactory, and a general revision of the genus is planned. Even when all the species are redescribed and their intra-specific variability estimated, it will still be necessary to study the extent of this variability in the sample to be identified. It is not possible, by this program or by any other method, to identify a population from a sample of less than ten specimens, and a large sample size (up to 30 specimens) will provide a more reliable identification.

The program has been written and is being tested with the species of the genus *Helicotylenchus*. It would work equally well with any other nematode genus, or in fact with any taxon of the animal and vegetal kingdom, and even with any collection of objects which can be fully described by measurements and qualitative characters.

Reference

Gower, J.C. (1971) A general coefficient of similarity and some of its properties. Biometrics 27:857-871.



Entomology Highlights

Boll Weevil *Anthonomus grandis grandis* -(A)- found heavily infesting a cotton field in Poston Arizona, just north of the Palo Verde Valley in Riverside County. Subsequent survey work by county and state detection personnel have since found the weevil in various California locations. The following status report by Martin Muschinske summarizes the boll weevil trapping activity in Southeastern California as of February 18:

To date, cotton boll weevils have been taken from four distinct geographical areas in California: 1) Bard/Winterhaven, Imperial County, 2) Imperial Valley, Imperial County, 3) the Blythe/Palo Verde area which includes portions of both Imperial and Riverside Counties, and 4) Vidal Junction, San Bernardino County.

1) Bard/Winterhaven, Imperial County

Cotton is produced on about 8500 acres in the Bard Valley/Winterhaven area. Located at the southeastern extreme of the state, this area is adjacent to the cotton-producing areas of Yuma, Arizona, and Algodones, Sonora, Mexico. The first recoveries of cotton boll weevil this season were reported from Bard by Imperial County Inspectors. To date, more than 1700 weevils have been trapped or recovered by visual field inspections. In addition, all immature stages have been found. The central 15 square miles, of the 45 square miles intensively trapped, show the greatest weevil activity. In general, most of the weevils trapped were taken along the Cocopah Canal north of Arnold Road to the All-American Canal. However, weevils have been trapped throughout the cotton-producing area. Ninety-nine percent of the cotton is in compliance with the January 1 plowdown requirement.

2) Imperial Valley, Imperial County

Approximately 39,000 acres of cotton are more or less equally distributed throughout the vast Imperial Valley which comprises over 950 square miles extending south from the Salton Sea to the Mexican border and east to the Highline Canal. To date, only nine weevils have been trapped. Eight of these were taken from within the 150 square miles north and east of Brawley. The last weevil was taken from one mile north of Imperial. No immature stages have been taken.

In addition to the weevils taken adjacent to cotton-growing areas, we have had adults recovered along Ogilby Road north to Highway 78 at least 20 miles from the nearest cotton fields in Palo Verde and about 25 miles east of Imperial Valley. A two-week extension was added to the January 15 plowdown date. The cotton fields in this area are 99% in compliance.

3) Blythe/Palo Verde Area, Riverside County

The major portion of cotton production in the Blythe area lies in Riverside County (approximately 27,000 acres). However, about 3,000 acres near the communities of Palo Verde is in Imperial County. For all practical purposes, we must consider this area as one production area, as cotton fields are contiguous at the county line. To date, we have taken more than 3900 weevils. In general, there are two foci of greatest weevil activity. One is about six miles south of the town of Blythe, involving 14 square miles along the Colorado River south to the Imperial/Riverside County line. The other is two miles south of the Palo Verde Diversion Dam also along the river.

Trap recoveries have been made in all extremes of the cotton production area. No immature stages have been found. About 96% of the cotton is in compliance with the February 1 plowdown date. No extensions have been granted in this area.

4) San Bernardino County

The infested area consists of one abandoned 200 acre cotton field in the Vidal Junction area in the southeastern corner of San Bernardino County. All stages of cotton boll weevil have been taken from this field and a total of 84 adults have been reported from traps. This cotton field has been brought under compliance as of this week.

In addition to routine trapping and visual field inspections, the infested areas of the Blythe/Palo Verde and Bard/Winterhaven areas along the Colorado River have been surveyed for native alternate host plants, and ground trash examination of suspected overwintering sites has been conducted. An additional survey of a more intensive nature was conducted during the last two weeks. One of the weevils collected from a cotton field near Vidal was determined to be in diapause. The remaining 11 weevils from the same field (found inside bolls) were in reproductive state and thus non-diapausing.

—— M. Muschinske

* * * * * * *

The following chart is a more in-depth look at boll weevil collections in California indicating localities, collectors and numbers of specimens. It should be noted that collection dates range only from October 18 through December 24. This is because there must be a cut-off date in order to meet publication deadlines. Collection data from late December through March or April will appear in the next issue.

Since finding heavy infestations of boll weevil at Poston, Arizona, survey personnel have made the following finds in California:

Winterhaven, Imperial County: 110 Adults, 3 Larvae
Collectors: Land, Collins, Lockhart, Fitzurka, Jensen, Pineda, Flock, Axe, Weddle, Garcia, Ramey, Wright, Starr
Brawley, Imperial County: 1 Adult, 0 Larvae
Collectors: Dash and Galindo
Calipatria, Imperial County: 1 Adult, 0 Larvae
Collector: Garcia
Blythe-Palo Verde, Riverside County: 26 Adults, 0 Larvae
Collectors: Reeves, Nelson, Japport, Muschinske, Gonzales, and Moreo
Vidal, San Bernardino County: 1 Adult, 0 Larvae
Collectors: Lampman and Brackin

(Det. by T.N. Seeno)

Carob Moth *Ectomyelois ceratoniae* -(Q)- (See CPPDR 1982 Vol 2 (1):11) A potentially serious pest of stored products, this pyralid moth was first found in dates at Indio, California. The first official state record was collected November 17 by Ruben Arias of Riverside County and Dr. Carpenter of the USDA. The following collection data indicate the widespread nature of the infestation. Collection dates range from November 17, 1982 through January 6, 1983 and the number of individual collections is 120.

County	Localities		Hosts	Collectors
Imperial	Bard		Dates	Parisek
	Winterhaven		Pomegranates	Penrose
	Niland			Lockhart
	Calipatria			
	Brawley			
	El Centro			
	Imperial			
	Desert Shores			
	Salton Sea			
Riverside	Thermal	Indio	Raisins	Parisek
	La Quinta	Rancho Mirage	Figs	Penrose
	Oasis	Mecca	Pomegranates	Ballen
	Palm Springs	Arabia	Grapes	Quisenberry
	Bende's Corners	Flowing Wells	Dates	Arias
	Cathedral City	Valerie Jean	Tangerines	USDA
	Coachella	Palm Desert		
	Indian Wells			
San Diego	Lemon Grove		Carob	Williams
	El Cajon			Moss

Carob moth has also been submitted from Yuma, Arizona and Algodones, Baja California. A live carob moth larva was also submitted by Mary Nicoletti of Santa Cruz County on January 4 after a homeowner found it in a tangerine purchased from a grocery store in Aptos. The fruit was very likely from the Coachella Valley or Yuma Valley (Det. by T.Eichlin and R.Somerby).

Redbanded whitefly *Tetraleurodes* sp. -(Q)- (See CPPDR 2(1):9) There have been 20 submissions of this whitefly since the original find in East San Diego. Delimitation of the infestation by San Diego County indicates that about 50 square miles are infested in the southern part of the county. The infestation is within the boundaries of Highways 805, 54 and Sweetwater Road to El Cajon Boulevard. One collection was from a nursery; all others are from residences. Collections were made on avocado between November 5 and November 8 by Ginsky, Blocker, Williams, Moss and Hinton (Det. by R. Gill).

Tulip tree scale *Toumeyella liriodendri* -(A)- 38 collections of this scale have been submitted to the laboratory from the infested area of San Leandro between November 10 and December 9. Collectors are Shankland, Gould, Eastman, Nielsen, Melendres and Baggott (det. by R. Gill).

Nantucket pine tip moth *Rhyacionia frustrana* -(B)- 8 collections were submitted to the laboratory between November 16 and January 13. Collections were made in San Bernardino (6) and San Diego (1) Counties and one collection was made in San Luis Obispo County on pines shipped from Orange County (Det. by R. Somerby and T. Eichlin).

In State Gypsy Moth Finds

DATE	LOCATION, CO.	COLLECTOR	REMARKS
8-16	Menlo Park, SM	V. Hennessy	
9-27	Palo Alto, STCL	Schmelzer	egg, larva, pupa on hawthorn
10-1	Westlake Village, LA	J.A. Moreno	larva, pupa in alder
10-14	Novato, Marin	T.D. Eichlin	egg, larva in shelter for garbage cans
10-15	Menlo Park, SM	K. Kingore	egg on barbeque
	Oakland, Alameda	Gee	
	Novato, Marin	Carrino	larva, pupa on wall of house
		Carrino, Berrios	egg on wall of house
10-18	San Mateo, SM	Smith, Mulberg, Johnson	egg, pupa
10-18	San Mateo, SM	J. Rudig	pupa
10-18	San Mateo, SM	S. Smith, J. Mulberg	egg in sycamore
10-19	Novato, Marin	Carrino, Berrios	larva, pupa in oak
10-21	Novato, Marin	Minyard, Brown	egg in oak
10-25	Pleasanton, Alameda	D. Zadig	pupa
10-26	Scotts Valley, STCZ	M. Morton, J. Bauer	egg on sailboat
11-5	Menlo Park, SM	K. Burke, J. Mercogliano	egg
11-10	Novato, Marin	J. Berrios	larva, pupa in woodpile
11-11	Menlo Park, SM	G. Agosta	egg in elm
12-2	Menlo Park, SM	G. Agosta	larva
12-3	Palo Alto, STCL	N. Wright	larva in Gypsy Moth egg mass cage
12-3	Clayton, CC	Cruickshank	larva in Gypsy Moth holding box
12-16	Los Altos, STCL	Goldsmith, Bakich	larva, pupa on lawn chair
12-16	Los Altos, STCL	Goldsmith, Bakich	larva, pupa, adult on barbeque
12-17	Clayton, CC	Cruickshank	larva in Gypsy Moth holding box
12-21	Clayton, CC	Cruickshank	larva in Gypsy Moth holding box
12-22	Palo Alto, STCL	J. Bombaci	larva-hatched in sleeve cage
	Clayton, CC	Cruickshank	larva in Gypsy Moth holding box
12-23	Menlo Park, SM	G. Agosta	larva from caged egg mass
1-3	Menlo Park, SM	G. Agosta	larva from caged egg mass
	Clayton, CC	Cruickshank	larva in Gypsy Moth holding box
1-6	Menlo Park, SM	S. Fox	larva in lawn mower bag

* * * * * * * * * * * * * * * *

LITERATURE REVIEW

Compendium of Cotton Diseases, G.M. Watkins, Editor. 1981, American Phytopathological Society, 3340 Pilot Knob Road, St. Paul, MN 55121, $15.00.

A recent addition to the A.P.S. Disease Compendia Series is the Compendium of Cotton Diseases, edited by Dr. G.M. Watkins of Texas A & M University. Plant pathologists who make field or laboratory diagnoses of cotton problems will find this book very useful.

Members of the Cotton Disease Council and other cotton disease specialists from around the world have contributed to the Compendium. It provides complete coverage of both infectious and non-infectious diseases, including excellent color illustrations of disease symptoms and drawings of pathogens and their life cycles. Guidelines for breeding for disease resistance and techniques of crop management for disease control are also included.

—— K. Kosta

NEW COUNTY RECORDS

An acarid mite *Tyrophagus neiswanderi* -(C)- Collected by Mr. R.B. Nesbitt and Mrs. W.W. Chui of the Orange County Agricultural Commissioner's Office. It belongs to the Family Acaridae, which is a family of mite pests of stored foods. *Tyrophagus neiswanderi* is the only member of the family that feeds on higher plants.

The mites were found causing injury to foliage and buds of pansies growing in ornamental beds at Knotts Berry Farm, Buena Park, California, on February 4, 1983 (83B7-15).

Tyrophagus neiswanderi has been reported from California, New York, and Ohio. The first California collection was made in Sacramento in 1982 (82C24-3). This was reported in the California Plant Pest and Disease Report of Summer, 1982 (Det. by T. Kono).

Chinese wax scale *Ceroplastes sinensis* -(B)- Collected for the first time in Orange County. Originally collected by Barry Coates of the Saratoga Horticultural Society and submitted through Les Barclay of U.C. Berkeley Extension, it was later recollected by John Ellis of the Orange County Agricultural Commissioner's Office. The scale was collected on *Maytenus boaria* plants growing in the Chilean section of the U.C. Irvine arboretum. The scale was tentatively identified by Les Barclay who submitted specimens to the entomology laboratory for confirmation. John Ellis confirmed the collection location on February 10. The scales were in the adult stage, but crawlers had not yet been produced. This collection marks a major extension of the range of this scale into Southern California. The only other known Southern California infestation is in Santa Barbara. The major infested areas of California include the towns around the southern part of San Francisco Bay (det. by R. Gill).

A mealybug near *Nipaecoccus* sp. -(Q)- was discovered in a nursery at Coarsegold, Madera County on November 8 by W.E. Carlson. Collections were made from the whorled leaves of bromeliads. The mealybug is undescribed and has been collected previously from Palos Verdes, Los Angeles County in 1978. The origin of the bromeliads is unknown in both cases (Det. by R. Gill).

A soil mealybug *Rhizoecus americanus* -(Q)- A serious pest of nursery stock in Florida, this mealybug is frequently encountered in quarantine. However, on December 17 specimens of this mealybug were collected in a nursery from the roots of *Nephthytis* at Fountain Valley, Orange County by D. Park. Eradication procedures were initiated by Nursery Services (Det. by R. Gill).

Fuchsia mite *Aculops fuchsiae* -(B)- Specimens were collected from Fort Bragg, Mendocino County on November 29 by S. Lincoln and at Palo Alto, Santa Clara County on November 25 by G. Raabe (Det. by T. Kono).

NEW STATE RECORDS

A leafhopper *Balclutha hebe* -(C)- 1 adult male specimen of this leafhopper was collected by Flock, Pineda and Orfiano while surveying a sesame field. The collection was made in Bard, Imperial County on September 23. The leafhopper is known commonly from southeastern U.S. (west to Texas), Mexico, Central and South America. Host plants are probably grasses and sedges. The species is one of the most common members of the genus (2 other species are common in California) but it is apparently non-economic. Adults are 2 mm long, drab greenish to tan (Det. by R. Gill, confirmed J.P. Kramer, USNM).

Quarantine and Exclusion
Pest Interceptions - Insects

The following Q-rated ants were collected in quarantine - (determinations by M.S. Wasbauer and F.G. Andrews):

Paratrechina fulva - Los Angeles County: Walnut, October 13, on *Areca* palm and *Ficus benjamina* from Georgia (D. Papilli); La Puente, October 13, on *Areca* palm from Georgia (D. Papilli); Los Angeles, October 12, on *Areca* palm from Florida (Kellam); Compton, October 25, on *Ficus benjamina* from Florida (Traxler); and Panorama City, November 23, on *Schefflera arboricola* from Florida (Miller, Shimoda).

Paratrechina vividula - Intercepted on *Chamaedorea seifrizii* from Florida at Los Angeles on December 15 (Kellam, Smice).

Technomyrnex albipes - Ventura County: Port Hueneme, October 25, on ginger from Hawaii (D. Van Epp, D. Mitchell). Santa Barbara County: Carpinteria, January 7, on *Dracaena marginata* from Hawaii (M. Pitchard).

Bigheaded Ant (*Pheidole megacephala*) - San Joaquin County: Modesto, October 14, on cut ginger flowers from Hawaii (T. Watkins). Santa Barbara County: Camarillo, January 6, on ginger from Hawaii (D. Van Epp).

Monomorium destructor - P.T. Melnikoff found a specimen on a coconut bank imported from the Phillipines via Hawaii, on November 24 in San Pedro, Los Angeles County.

The following Lepidoptera were encountered in quarantine (determinations by T.D. Eichlin and R.E. Somerby):

Gypsy Moth (*Lymantria dispar*) -(A)- was intercepted 57 times between October 11 and January 21, on outdoor household items from the following states: Connecticut, New Jersey, New York, New Hampshire, Massachusetts, Maryland, Pennsylvania, Maine, Rhode Island, Vermont and Wisconsin.

Eastern tent caterpillar (*Malacosoma americanum*) -(Q)- Fresno County: Clovis, August 23, larvae on dog house, origin unknown (J. Thompson). San Diego County: Chula Vista, October 21, cocoons on outdoor table from Virginia (J. Kenyon).

A tent caterpillar (*Malacosoma* sp.) -(Q)- Sonoma County: Windsor, October 21, on outdoor furniture from Pennsylvania (Westoby). San Diego County: San Diego, January 4, on a chaise longue from New Jersey (Ginsky).

European corn borer (*Ostrinia nubilalis*) -(A)- Larvae found in millet, origin unknown, at San Juan Bautista, San Benito County, November 22 (M. Tognazzini).

A Pyralid moth (*Corcyra cephalonica*) -(Q)- Larvae and adults in rice from Singapore at Stockton, San Joaquin County, December 14 (T. Watkins). Larvae, pupae and adults in rice from Brazil at San Francisco January 4 (S. Brown).

A Noctuid moth -(Q)- Larvae and pupae on Ti leaves from Hawaii at Ventura, Ventura County December 9 (D. Van Epp). Larvae on foliage (type unknown) from Hawaii at Santa Cruz, Santa Cruz County, December 16 (J. Bauer).

A Noctuid moth (*Spodoptera dolichos*) -(Q)- Larva in aquatic plants from Florida at Canoga Park, Los Angeles County, December 22 (Hamilton).

A Noctuid moth (*Spodoptera* sp.) -(Q)- Larva on mini rose from South Carolina at Santa Cruz, Santa Cruz County, October 13 (J. Bauer).

An Arctiid moth -(Q)- San Diego County: San Diego, October 12, pupa in antique wagon from West Virginia (B. Bowers); San Diego, December 3, larvae in orchids and bromeliads from Mexico (Walsh).

A Tortricid moth (*Amorbia* sp.) -(Q)- Larva, host unknown, from Hawaii at Gardena, Los Angeles County, December 7 (Rawald, Sulentich).

Pink bollworm (*Pectinophora gossypiella*) -(A)- Found in cotton, origin unknown, at Winterhaven, Imperial County, mid-October (Weddle).

Melonworm (*Diaphania hyalinata*) -(A)- Adults on *Pittosporum* from Florida at Los Angeles, October 20 (M. Adams).

Bagworm (*Thyridopteryx ephemeraeformis*) -(A)- On *Areca* palm from Florida at Los Angeles, December 30 (Kellam).

A European Pierid moth (*Pieris brassicae*) -(Q)- Larva found in aircraft crew area, from England, at Merced, Merced County, November 12 (G. Caseri, R. Aguilar).

The following miscellaneous insects were taken in quarantine:

A possible powderpost termite (*Cryptotermes brevis*) -(Q)- Nymph in wood palates from Hawaii at Stockton, San Joaquin County, December 28, by K. Brown and S. Barnes (det. A.R. Hardy).

A possible Kalotermitid termite -(Q)- In *Dracaena* from Costa Rica at Half Moon Bay, San Mateo County, November 12 by G. Raabe (det. A.R. Hardy).

A Cockroach, an earwig (*Labia* sp.?) and a wood-boring beetle -(Q)- In wooden shipping crates from India at Marysville, Yuba County, November 5 by C. Devany and E. Storm (det. A.R. Hardy and F.G. Andrews).

A Cockroach (*Diploptera punctata*) -(Q)- Nymph on cut ginger and anthurium flowers from Hawaii at Eureka, Humboldt County, November 2 by Spadoni (det. A.R. Hardy).

Raspberry root gall wasp (*Diastrophus radicum*) -(Q)- On raspberry from South Dakota at Eureka, Humboldt County, November 2 by Spadoni (det. M.S. Wasbauer).

Mexican fruit fly (*Anastrepha ludens*) -(A)- Edmondson found larvae in an orange from Mexico at Hollister, San Benito County, October 21 (det. K.S. Corwin).

A twig borer (*Heterobostrychus aequalis*) -(Q)- In wicker basket, origin unknown, at Visalia, Tulare County, October 26 by J. Gilley (det. F.G. Andrews).

A drugstore beetle (Anabiidae) -(Q)- On palm leaves from Brazil at San Francisco, January 4 by S. Brown (det. A.R. Hardy).

A Slug (*Veronicella krausii*) -(Q)- On *Dracaena* from Puerto Rico at Cardiff, San Diego County, December 7 by D. Nielsen (det. T. Kono and D. Munkittrick).

A Snail (*Subulina octona*) -(Q)- On *Areca* palm from Florida at Los Angeles, October 12 by N. Kellam (det. T. Kono).

A Snail (*Lamellaxis gracilis*) -(Q)- On *Dracaena* from Hawaii at San Lorenzo, Alameda County, November 19 by Lauritzen (det. T. Kono and D. Munkittrick).

The following scale insects were intercepted on cut flowers and foliage shipped from Hawaii (det. R.J. Gill and T. Kono).

Green shield scale (*Pulvinaria psidii*) -(A)- San Joaquin County: Stockton, October 28 (T. Watkins); Modesto, October 21 (T. Watkins). Santa Barbara County: Orcutt, November 12 (M. Pitchard). San Mateo County: So. San Francisco, November 18 (L. Buerer). San Diego County: Escondido, November 19 (Ginsky, Walsh). San Luis Obispo County: Atascadero, October 21 (M. Pitchard). Ventura County: Simi Valley, December 13 (D. Van Epp); Oxnard, December 17 (D. Van Epp); Santa Paula, October 15 (D. Mitchell); Ojai, December 10 (D. Van Epp).

Magnolia white scale (*Pseudaulacaspis cockerelli*) -(A)- San Mateo County: So. San Francisco, December 1, 15, January 6 (L. Buerer). Ventura County: Ojai, December 10 (D. Van Epp). Los Angeles County: Culver City, November 19 (Adams, Hamilton).

Lesser snow scale (*Pinnaspis strachani*) -(A)- San Mateo County: So. San Francisco, November 18 (two separate collections; L. Buerer). Ventura County: City unknown, December 27 (D. Mitchell). Los Angeles County: Los Angeles, November 10 (Adams).

Boxwood scale (*Pinnaspis buxi*) -(Q)- Ventura County: Ventura, October 18, December 10 (D. Mitchell); Ojai, December 10 (D. Van Epp); Oxnard, December 17 (D. Van Epp); Simi Valley, December 13 (D. Van Epp).

A mealybug (*Pseudococcus* sp. near *lycopodii*) -(Q)- Ventura County: Ventura, December 17 (D. Van Epp). Humboldt County: Arcata, December 31 (Hazzard).

Spiraling whitefly (*Aleurodicus dispersus*) -(Q)- (egg track)-Los Angeles County: Los Angeles, November 10 (Adams).

Torpedo bug (*Siphanta acuta*) -(Q)- (egg mass)-Los Angeles County: Los Angeles, November 10 (Adams).

BORDER STATION INTERCEPTIONS
(Since October 1982)

CHAFF SCALE (*Parlatoria pergandii*)	-B-	77
GLOVER SCALE (*Lepidosaphes gloverii*)	-B-	8
YANON SCALE (*Unaspis yanonensis*)	-Q-	26
PURPLE SCALE (*Lepidosaphes beckii*)	-B-	37
CALIFORNIA RED SCALE (*Aonidiella aurantii*)	-B-	25
ORIENTAL SCALE (*Aonidiella orientalis*)	-Q-	10
PINE TORTOISE SCALE (*Toumeyella parvicornis*)	-Q-	1
PINE SCALE (*Chionaspis heterophyllae*)	-Q-	1
ROUND CONIFER SCALE (*Acutaspis morrisonorum*)	-Q-	1
LESSER SNOW SCALE (*Pinnaspis strachani*)	-A-	2

MASKED SCALE (*Mycetaspis personatus*)	-Q-	1
HOLLY SCALE (*Dynaspidiotus brittanicus*)	-B-	6
URBAN PULVINARIA SCALE (*Pulvinaria urbicola*)	-Q-	1
CAMPHOR SCALE (*Pseudaonidia duplex*)	-Q-	2
A FALSE PIT SCALE (*Cerococcus* sp. undescribed)	-Q-	1
MARGARODID SCALE (*Icerya palmeri*)	-Q-	1
CITRUS SNOW SCALE (*Unaspis citri*)	-B-	1
COCONUT SCALE (*Aspidiotus destructor*)	-A-	1
GYPSY MOTH (*Lymantria dispar*)	-A-	51
A PYRALID MOTH (Pyralidae)	-Q-	2
PINK BOLLWORM (*Pectinophora gossypiella*)	-A-	67
HICKORY SHUCKWORM (*Cydia caryana*)	-A-	38
AN ARCTIID MOTH (*Arctiidae*)	-Q-	2
EASTERN TENT CATERPILLAR (*Malacosoma americanum*)	-Q-	8
A TENT CATERPILLAR (*Malacosoma* sp.)	-Q-	17
AN OWLET MOTH (Noctuidae)	-Q-	1
SUGARCANE BORER (*Diatraea saccharalis*)	-A-	3
A PYRALID MOTH (*Crambus* sp.)	-Q-	1
A LEAFROLLER (Tortricidae)	-Q-	3
A WOOLY BEAR (Arctiidae)	-Q-	2
EUROPEAN CORN BORER (*Ostrinia nubilalis*)	-A-	10
A MOTH (Gelechiidae)	-Q-	3
A BAGWORM (Psychidae)	-A-	2
MELONWORM (*Diaphania hyalinata*)	-A-	1
A PLUME MOTH (Pterophoridae)	-Q-	1
APPLE MAGGOT (*Rhagoletis pomonella*)	-A-	219
HOLLY LEAFMINER (*Phytomyza ilicis*)	-B-	76
WALNUT HUSK MAGGOT (*Rhagoletis suavis*)	-A-	14
A MEALYBUG (*Planococcus* sp.)	-Q-	1
A MEALYBUG (Pseudococcidae)	-Q-	1
JAPANESE MEALYBUG (Probably *Planococcus kraunhiae*)	-Q-	5
CLOUDY-WINGED WHITEFLY (*Dialeurodes citrifolii*)	-A-	1
STRIPED MEALYBUG (*Ferrisia virgata*)	-B-	1
HACKBERRY GALL PSYLLID (*Pachypsylla* sp.)	-Q-	1
AN ANT (*Camponotus (Myrmothrix) abdominalis floridanus*)	-Q-	1
AN ANT (*Brachymyrmex depilis*)	-Q-	1
AN ANT (*Conomyrma flavopecta*)	-Q-	1
AN ANT (*Paratrechina fulva*)	-Q-	2
AN ANT (*Tapinoma melanocephalum*)	-Q-	1
IMPORTED FIRE ANT (*Solenopsis invicta*)	-A-	2
CRAZY ANT (*Paratrechina longicornis*)	-B-	2
BLACK-HEADED ANT (*Tapinoma melanocephalum*)	-Q-	1
AN ANT (*Paratrechina* sp.)	-Q-	1
A SUBTERRANEAN TERMITE (*Reticulitermes* sp.)	-Q-	2
A LEAFHOPPER (*Oncometopia nigricans*)	-Q-	1
BOLL WEEVIL (*Anthonomus grandis*)	-A-	14
SWEET POTATO WEEVIL (*Cylas formicarus elegantulus*)	-A-	9
A WEEVIL (Curculionidae)	-A-	3
A WEEVIL (*Conotrachelus* sp.)	-A-	1
SOUTHERN CORN ROOT WORM (*Diabrotica undecimpunctata howardi*)	-A-	1
JAPANESE BEETLE (*Popillia japonica*)	-A-	1
A SNAIL (*Opeas* sp. ?)	-Q-	1

The following scale insects and mealybugs were intercepted in Quarantine (Det. by R. Gill):

Rating	Species	Common Name	Origin	County	Host	Collector
Q	*Dysmicoccus alazon**	Alazon mealybug	Ecuador	LA	Banana	Eisenhart
	*Three separate collections - Dec. 8, 10; Jan. 5 (same data)					
			Ecuador	CC	Banana	Case, Kean
Q	*Rhizoecus americanus*	A soil mealybug	Florida	LA	Areca	Sulentich
			Florida	LA	Areca	Miller
			Florida	LA	Areca	Miller, Shimoda
			Florida*	LA	Areca	Kellam
	*Two separate collections - Oct. 29; Dec. 3 (same data)					
			?	LA	*Nephthytis*	Smice, Adams
Q	*Rhizoecus* sp.	A soil mealybug	Hawaii	LA	Areca	Adams
Q	*Pseudococcus elisae*	Elisa mealybug	Puerto Rico	SJ	*Croton*	Willson
			Panama	LA	Banana	White, Eisenhart
A	*Kilifia acuminata**	Acuminate scale	Florida	SM	*Philodendron*	Buerer
	*Three separate collections - Oct. 13; Dec. 14; Jan. 20 (same data)					
Q	*Acutaspis umbonifera*	An armored scale	Costa Rica	LA	Banana	Papilli
			Costa Rica	LA	Banana	Eisenhart
A	*Abgrallaspis palmae*	Tropical palm scale	Ecuador	LA	Banana	Eisenhart
A	*Parlatoria* sp. nr. *proteus*	An Armored scale	Texas	LA	*Ficus*	Watanabe
Q	Pseudococcidae	A mealybug	Costa Rica	LA	Banana	Papilli
			Costa Rica	LA	Banana	Eisenhart
Q	*Ceroplastes* sp. prob. *floridensis*	A wax scale	Florida	LA	*Ficus*	Papilli
A	*Parlatoria vandae*	Parlatoria vanda scale	Taiwan	SD	Orchids	Ginsky
Q	*Dialeurodes kirkaldyi*	Kirkaldy whitefly	Hawaii	ALA	-	Lauritzen
A	*Dialeurodes citrifolii*	Cloudy wing whitefly	Florida	AM	Citrus	Watkins
Q	*Dysmicoccus* sp.	A mealybug	Costa Rica	LA	Banana	Olson
Q	*Mesolecanium* sp.	A soft scale	Mexico	SD	Bromeliads	Blocker
A	*Ischnaspis longirostris*	Black thread scale	Costa Rica	STB	*Dracaena*	Pruner, Piper, Gillett
A	*Pseudaulacaspis cockerelli*	Magnolia white scale	Hawaii	STB	Coconut	Van Epp
			Florida*	LA	Areca	Miller
	*Two separate collections - Oct. 14; Nov. 24 (same data)					
A	*Pinnaspis strachani*	Lesser snow scale	Hawaii	LA	*Dracaena*	Kellam
			Florida	LA	*Chamaedorea*	Kellam
			Florida	LA	Areca	Miller
Q	*Pinnaspis buxi*	Boxwood scale	Hawaii	SD	Areca	Mariscal
A	*Pulvinaria psidii*	Green shield scale	Hawaii	SD	*Ficus*	Smith
			Hawaii	ALA	*Ficus*	Lauritzen
Q	*Geococcus coffeae*	A soil mealybug	Hawaii*	SD	*Neanthe*	Boch
	*Three separate collections - Nov. 2, 17; Dec. 21 (same data)					
			Florida	LA	Areca, *Chamaedorea*	Kellam, Smice
			Hawaii	LA	palm	Rawald, Sulentich
Q	*Aleurodicus dispersus*	Spiraling whitefly	Hawaii	LA	*Spathiphyllum*	Hamilton
Q	*Siphanta acuta*	Torpedo bug	Hawaii	LA	*Spathiphyllum*	Hamilton
A	*Clavaspis herculeana*	Herculeana scale	Hawaii	LA	*Plumeria*	Hamilton, Adams
Q	*Asterolecanium pustulans*	Pustule scale	Hawaii	LA	*Plumeria*	Hamilton, Adams
Q	*Coccus viridis*	Green scale	Hawaii	LA	*Plumeria*	Hamilton, Adams

GYPSY MOTH ACTIVITIES - 1982

By Rollin R. Brown

The following data were compiled by Rollin R. Brown, Exclusion Biologist for the CDFA Pest Exclusion Unit. His report summarizes the gypsy moth quarantine border station interceptions for 1982.

Border Stations

A total of 146 interceptions of gypsy moth life stages (mostly egg masses) was made, usually from recreation vehicles (RV's) of various types (campers, house trailers, camping trailers, boat trailers, etc.) during the calendar year of 1982 by border station personnel. This figure compares with 47 interceptions made last year, a 311% increase.

High pressure, hot water (1700 PSI, 200°F) cleaning units were utilized at the stations to remove all gypsy moth life stages from the vehicle as a condition of entry into California.

Warning Notices

A total of 16,338 shipments of household goods (HHG), from areas known to be infested with gypsy moth, were identified at the border stations and permitted to proceed into California under quarantine, with a Gypsy Moth Warning Notice (008A) mailed to the agricultural commissioner of the county of destination for each individual shipment. As a result of inspections at the county level, an additional 198 interceptions of gypsy moth life stages were made, as compared to 212 last year, a slight decrease of 7%.

Summary

As a result of exclusion activities, a total of 344 interceptions of gypsy moth life stages was accomplished. Of these, 123 (36%) were determined to be viable when discovered by the inspector. (In 1981, 105 of the 212 (41%) were viable).

Each of these 123 interceptions represents the potential of a Santa Barbara type infestation. The joint efforts of state and county pest exclusion personnel in dealing with the gypsy moth threat exemplify the pest exclusion goal of preventing plant pest problems from happening.

GYPSY MOTH REPORT - 1982

BORDER STATIONS INTERCEPTIONS

ALTURAS	0
BENTON	2
BLYTHE	3
LONG VALLEY	0
McCLOUD	1
MEYERS	14
MT. SHASTA	6
NEEDLES	18
REDWOOD HWY	5
SMITH RIVER	14
TOPAZ	1
TRUCKEE	33
TULELAKE	1
VIDAL	1
WINTERHAVEN	7
YERMO	40
TOTAL	146

GYPSY MOTH ORIGINS

ORIGIN (State)	BORDER STATIONS (RV's)	COUNTY (HHG)		TOTALS
New York	33	45	=	78
New Jersey	23	47	=	70
Connecticut	23	42	=	65
Massachusetts	31	32	=	63
New Hampshire	15	12	=	27
Pennsylvania	14	8	=	22
Vermont	2	3	=	5
Maryland	0	4	=	4
Rhode Island	3	1	=	4
Delaware	0	1	=	1
Washington, D.C.	1	0	=	1
Maine	0	1	=	1
East Coast	0	1	=	1
Washington (State)	0	1	=	1
Wisconsin	1	0	=	1
TOTAL	146	198		344

MONTHLY TOTALS

Month	Station (RV's)	County (HHG)	Total
JAN	0	12	12
FEB	0	10	10
MAR	0	8	8
APR	4	10	14
MAY	3	14	17
JUN	8	9	17
JUL	31	33	64
AUG	38	25	63
SEP	17	17	34
OCT	21	18	39
NOV	11	14	25
DEC	13	28	41
TOTAL	146	198	344

VIABILITY

Alive	Dead
9	3
5	5
7	1
5	9
4	13
5	12
18	46
23	40
17	17
16	23
2	23
12	29
123	221

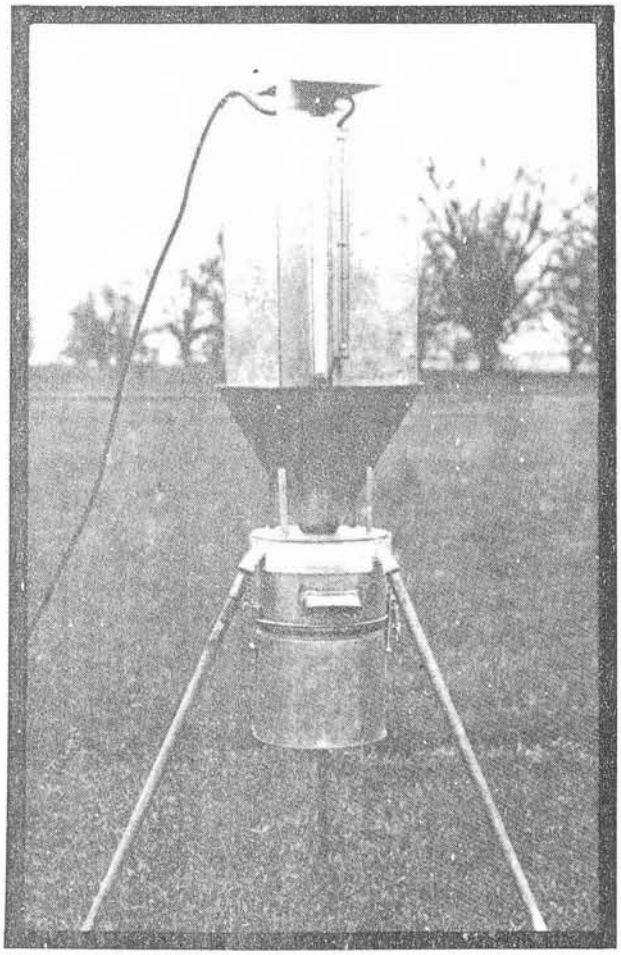
RV = recreation vehicles
HHG = household goods

SAN JOAQUIN COUNTY BLACK-LIGHT TRAP REPORTS: An Ongoing Program

R.E. Somerby

Black-light traps are valuable research and survey tools for determining the presence of certain nocturnal insects and for obtaining indices of their population levels. Light traps gather a number of different kinds of information and an abundance of basic data in a cost-effective manner. Locally, they yield information relative to the outbreak of infestations before damage begins to show up. Trapping results may also indicate which species have overwintered as adults, thus representing an early potential for damage.

When one routinely surveys the local districts, familiarity with the common species is acquired. This enables the surveyor to detect unfamiliar insects which may represent newly introduced species. In such a manner the surveyor meets local needs for pest detection and for pest management decisions.



Black-Light insect survey trap

Black-light traps also have a more general application as an aid in determining the time of appearance and seasonal abundance of important insect pest species. The information can be used to model species abundance with other biological and physical parameters of the environment. Fluctuations in generation time and number of generations per year are two such examples of environmentally dependent variables.

Finally, information from black-light trap surveys serves as a database for long-term monitoring of trends in species abundance relevant to continuing research interests.

R.E. Somerby is a Systematic Entomologist with the Analysis and Identification Unit of CDFA in Sacramento.

* *

The following black-light trap reports are submitted by the San Joaquin County Agricultural Commissioner's Office. These reports and similar ones have been submitted for a number of years and have been recorded in CPPDR and its predecessors. The reports are one of the few California sources of trap data available over a long period of time.

SAN JOAQUIN COUNTY BLACK LIGHT TRAP REPORT

DATE	10-17-82	10-17-82	10-18-82			
LOCATION	Bellota	Manteca	Roberts Island			
TEMPERATURE		46-76				
ALFALFA LOOPER Autographa californica	1		7			
ARMYWORM Pseudaletia unipuncta	4	4	25			
BEET ARMYWORM Spodoptera exigua	69	29	237			
BLACK CUTWORM Agrotis ipsilon	3	2	5			
CABBAGE LOOPER Trichoplusia ni						
CLOVER CUTWORM Scotogramma trifolii						
CODLING MOTH Laspeyresia pomonella						
CORN EARWORM, (ETC.) Heliothis zea	1		4			
FAISE CELERY LEAFTIER Udea profundalis		2	24			
GRANULATE CUTWORM Feltia subterranea	19	11	87			
GRAPE LEAFFOLDER Desmia funeralis						
NAVEL ORANGEWORM Amyelois transitella		14				
OMNIVOROUS LEAFROLLER Platynota stultana						
PEACH TWIG BORER Anarsia lineatella		30				
ROUGH SKINNED CUTWORM Proxenus mindara	1		3			
SALTMARSH CATERPILLAR Estigmene acrea						
SPOTTED CUTWORM Amathes c-nigrum	17	2	13			
SUGARBEET WEBWORM Loxostege sticticalis						
TOBACCO BUDWORM Heliothis virescens						
VARIEGATED CUTWORM Peridroma saucia			2			
W.YELLOWSTRIPED ARMYWORM Spodoptera praefica						

SAN JOAQUIN COUNTY BLACK LIGHT TRAP REPORT

DATE	10-24-82	10-24-82	10-24-82	10-31-82	11-2-82	11-1-82
LOCATION	Bellota	Manteca	Roberts Island	Bellota	Manteca	Roberts Island
TEMPERATURE		61-75 rain-.4in.			42-70	
ALFALFA LOOPER *Autographa californica*	1	2	7	1	1	
ARMYWORM *Pseudaletia unipuncta*	9	11	27	16	7	29
BEET ARMYWORM *Spodoptera exigua*	135	67	193	10	4	9
BLACK CUTWORM *Agrotis ipsilon*	4	4	6	9	1	6
CABBAGE LOOPER *Trichoplusia ni*	1	1	1			
CLOVER CUTWORM *Scotogramma trifolii*						
CODLING MOTH *Laspeyresia pomonella*						
CORN EARWORM, (ETC.) *Heliothis zea*	1	1	3		1	1
FALSE CELERY LEAFTIER *Udea profundalis*	7	2	25			2
GRANULATE CUTWORM *Feltia subterranea*	57	18	59	16	12	12
GRAPE LEAFFOLDER *Desmia funeralis*						
NAVEL ORANGEWORM *Amyelois transitella*	2	4			2	
OMNIVOROUS LEAFROLLER *Platynota stultana*	1		2			
PEACH TWIG BORER *Anarsia lineatella*		185			2	
ROUGH SKINNED CUTWORM *Proxenus mindara*	2	1	4			1
SALTMARSH CATERPILLAR *Estigmene acrea*						
SPOTTED CUTWORM *Amathes c-nigrum*	18	1	18	3	3	11
SUGARBEET WEBWORM *Loxostege sticticalis*						
TOBACCO BUDWORM *Heliothis virescens*						
VARIEGATED CUTWORM *Peridroma saucia*	2	1				
W.YELLOWSTRIPED ARMYWORM *Spodoptera praefica*						

SAN JOAQUIN COUNTY BLACK LIGHT TRAP REPORT

DATE	11-14-82	11-14-82	11-15-82	11-21-82	11-21-82	11-21-82
LOCATION	Manteca	Bellota	Roberts Island	Bellota	Manteca	Roberts Island
TEMPERATURE	High-46 Low -39				High-60 Low -45	
ALFALFA LOOPER Autographa californica		1		4		
ARMYWORM Pseudaletia unipuncta	9	26	5	18	3	40
BEET ARMYWORM Spodoptera exigua						
BLACK CUTWORM Agrotis ipsilon	2	10	30	10	2	46
CABBAGE LOOPER Trichoplusia ni						
CLOVER CUTWORM Scotogramma trifolii						
CODLING MOTH Laspeyresia pomonella						
CORN EARWORM, (ETC.) Heliothis zea						
FALSE CELERY LEAFTIER Udea profundalis						
GRANULATE CUTWORM Feltia subterranea	8			6	1	
GRAPE LEAFFOLDER Desmia funeralis						
NAVEL ORANGEWORM Amyelois transitella						
OMNIVOROUS LEAFROLLER Platynota stultana						
PEACH TWIG BORER Anarsia lineatella						
ROUGH SKINNED CUTWORM Proxenus mindara						
SALTMARSH CATERPILLAR Estigmene acrea						
SPOTTED CUTWORM Amathes c-nigrum		1		1		1
SUGARBEET WEBWORM Loxostege sticticalis						
TOBACCO BUDWORM Heliothis virescens						
VARIEGATED CUTWORM Peridroma saucia				2		2
W.YELLOWSTRIPED ARMYWORM Spodoptera praefica						

SAN JOAQUIN COUNTY BLACK LIGHT TRAP REPORT

DATE	11-30-82 12-1-82	12-5-82	12-5-82	12-$\frac{5}{6}$-82	12-12-82	12-16-82
LOCATION	Roberts	Bellota	Manteca	Roberts	Bellota	Manteca
TEMPERATURE			Low 34 High 52		Rain	Rain
ALFALFA LOOPER Autographa californica		2				
ARMYWORM Pseudaletia unipuncta	6	51	5	25		9
BEET ARMYWORM Spodoptera exigua					20	
BLACK CUTWORM Agrotis ipsilon	11	9	1	13	13	2
CABBAGE LOOPER Trichoplusia ni						
CLOVER CUTWORM Scotogramma trifolii						
CODLING MOTH Laspeyresia pomonella						
CORN EARWORM, (ETC.) Heliothis zea						
FALSE CELERY LEAFTIER Udea profundalis						
GRANULATE CUTWORM Feltia subterranea		1	7			1
GRAPE LEAFFOLDER Desmia funeralis						
NAVEL ORANGEWORM Amyelois transitella						
OMNIVOROUS LEAFROLLER Platynota stultana						
PEACH TWIG BORER Anarsia lineatella						
ROUGH SKINNED CUTWORM Proxenus mindara						
SALTMARSH CATERPILLAR Estigmene acrea						
SPOTTED CUTWORM Amathes c-nigrum		1			1	
SUGARBEET WEBWORM Loxostege sticticalis						
TOBACCO BUDWORM Heliothis virescens						
VARIEGATED CUTWORM Peridroma saucia		6		1	9	
W.YELLOWSTRIPED ARMYWORM Spodoptera praefica						

SAN JOAQUIN COUNTY BLACK LIGHT TRAP REPORT

DATE	12-19-82	12-12/14-82	12-26-82	12-28-82	1-2-83	1-5-83
LOCATION	Bellota	Roberts Island	Bellota	Manteca	Bellota	Manteca
TEMPERATURE	Rain	Light Rain	Clear	Clear	Clear	Fog
ALFALFA LOOPER *Autographa californica*	15					
ARMYWORM *Pseudaletia unipuncta*	16	3				
BEET ARMYWORM *Spodoptera exigua*					1	1
BLACK CUTWORM *Agrotis ipsilon*						
CABBAGE LOOPER *Trichoplusia ni*						
CLOVER CUTWORM *Scotogramma trifolii*						
CODLING MOTH *Laspeyresia pomonella*						
CORN EARWORM, (ETC.) *Heliothis zea*						
FALSE CELERY LEAFTIER *Udea profundalis*						
GRANULATE CUTWORM *Feltia subterranea*						
GRAPE LEAFFOLDER *Desmia funeralis*						
NAVEL ORANGEWORM *Amyelois transitella*						
OMNIVOROUS LEAFROLLER *Platynota stultana*						
PEACH TWIG BORER *Anarsia lineatella*						
ROUGH SKINNED CUTWORM *Proxenus mindara*						
SALTMARSH CATERPILLAR *Estigmene acrea*						
SPOTTED CUTWORM *Amathes c-nigrum*						
SUGARBEET WEBWORM *Loxostege sticticalis*						
TOBACCO BUDWORM *Heliothis virescens*						
VARIEGATED CUTWORM *Peridroma saucia*	2		2			
W.YELLOWSTRIPED ARMYWORM *Spodoptera praefica*						
A NOCTUID MOTH *Autographa biloba*				1		

1/27/83 Manteca + Roberts Is. Negative

SAN JOAQUIN COUNTY BLACK LIGHT TRAP REPORT

DATE	1-10-83	1-16-83	1-16-83	1-16-83 1-17-83	1-23-83	1-30-83
LOCATION	Manteca	Manteca	Bellota	Roberts Island	Bellota	Bellota
TEMPERATURE	Fog		Light Rain			
ALFALFA LOOPER Autographa californica						
ARMYWORM Pseudaletia unipuncta			2	11		
BEET ARMYWORM Spodoptera exigua		1			2	
BLACK CUTWORM Agrotis ipsilon	1		3	6		
CABBAGE LOOPER Trichoplusia ni						
CLOVER CUTWORM Scotogramma trifolii						
CODLING MOTH Laspeyresia pomonella						
CORN EARWORM, (ETC.) Heliothis zea						
FALSE CELERY LEAFTIER Udea profundalis						
GRANULATE CUTWORM Feltia subterranea						
GRAPE LEAFFOLDER Desmia funeralis						
NAVEL ORANGEWORM Amyelois transitella						
OMNIVOROUS LEAFROLLER Platynota stultana						
PEACH TWIG BORER Anarsia lineatella						
ROUGH SKINNED CUTWORM Proxenus mindara						
SALTMARSH CATERPILLAR Estigmene acrea						
SPOTTED CUTWORM Amathes c-nigrum						
SUGARBEET WEBWORM Loxostege sticticalis						
TOBACCO BUDWORM Heliothis virescens						
VARIEGATED CUTWORM Peridroma saucia			4	3		
W.YELLOWSTRIPED ARMYWORM Spodoptera praefica						
A NOCTUID MOTH Homoglaea NR carbonaria			1		2	1

SAN JOAQUIN COUNTY BLACK LIGHT TRAP REPORT

DATE	1-30-83 2-1-83	2-7-83	2-8-83	2-13-83	2-14-83	2-14-83 2-15-83
LOCATION	Roberts Island	Bellota	Manteca	Manteca	Bellota	Roberts Island
TEMPERATURE						
ALFALFA LOOPER Autographa californica					1	
ARMYWORM Pseudaletia unipuncta						
BEET ARMYWORM Spodoptera exigua						
BLACK CUTWORM Agrotis ipsilon						
CABBAGE LOOPER Trichoplusia ni						
CLOVER CUTWORM Scotogramma trifolii						
CODLING MOTH Laspeyresia pomonella						
CORN EARWORM, (ETC.) Heliothis zea						
FALSE CELERY LEAFTIER Udea profundalis						
GRANULATE CUTWORM Feltia subterranea						
GRAPE LEAFFOLDER Desmia funeralis						
NAVEL ORANGEWORM Amyelois transitella						
OMNIVOROUS LEAFROLLER Platynota stultana						
PEACH TWIG BORER Anarsia lineatella						
ROUGH SKINNED CUTWORM Proxenus mindara						
SALTMARSH CATERPILLAR Estigmene acrea						
SPOTTED CUTWORM Amathes c-nigrum						
SUGARBEET WEBWORM Loxostege sticticalis						
TOBACCO BUDWORM Heliothis virescens						
VARIEGATED CUTWORM Peridroma saucia						
W.YELLOWSTRIPED ARMYWORM Spodoptera praefica	2			1		1
A NOCTUID MOTH Xylomyges hiemalis		1	2	2	3	
GREEN FRUIT WORM Orthosia hibisci					8	1

TO KEEP YOUR NAME ON OUR MAILING LIST, PLEASE
RETURN THIS COUPON BY APRIL 30, 1983

* *

PLEASE PRINT OR TYPE

Name: ______________________________

Company (optional) ______________________________

Address: ______________________________

____

City & State: ______________________________

Zipcode: ______________________________

RETURN TO:

Analysis & Identification
California Department of Food & Agriculture
1220 N Street, Room 340
Sacramento, CA 95814